

Influence of Cooperative Type Model of Group Investigation on Students' Cognitive Learning Outcomes

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Abstract: *This study aims to determine the effect of cooperative learning model of Group Investigation (GI) on learning outcomes and student interpersonal communication development. The study is quasi experimental, with two group pretest post-test design. The study population was all students of class XI SMA Negeri 11 Medan in academic year 2016/2017. Samples were taken from two classes of the population by random sampling technique. One class is the experimental class taught by cooperative learning model GI and the control class was taught by conventional learning. The research instruments consisted of cognitive tests. Achievement test used to measure learning outcomes. Cognitive learning outcomes were analyzed by t-test. The results showed that there was an influence of cooperative learning model GI on learning outcomes. Through the cooperative model GI type, atmosphere to learn was more effective, cooperative relationships in the learning group inspired students to have courage to express opinions, communicate and share information with friends in solving learning problems.*

Keywords: *cooperative learning type group investigation, cognitive learning outcomes*

1. Introduction

The main support for the achievement of development goals is the quality of Indonesian human quality education. Quality education is not done only through the transformation of knowledge in science and technology, but among others supported by the development of the ability of learners to help themselves to choose and make decisions in the achievement of its goals. The ability of the participants is not only the academic aspect, but also concerning aspects of personal development, social, intellectual maturity, and value systems.

Factors that lead to less success in academics is not only intelligence, but also character issues, namely self-confidence, ability to cooperate, social skills, ability to concentrate, empathy and communication skills. A person's ability to interact is called interpersonal communication skills.

Teachers should ask questions that lead students to think and ask scientifically oriented questions, open-ended questions that get them to carry out investigations to find scientific answers (Li & Arshad, 2015. p.154). This can be done to improve learning outcomes and student interpersonal communication. According to Siska, Sudardjo & Purnamaningsih (2003, p.70), one of the factors that affect a person's interpersonal communication skills is confidence. The higher the confidence, the lower the interpersonal communication anxiety, and vice versa.

Physics is a science that includes clumps of Science, therefore, has the same characteristics with the physics of Science; these characteristics are the objects of physics, how to obtain and use.

1.1. Learning physics in SMA / MA

There are two issues related to physics that are inseparable, namely physics as a product (in the form of facts, concepts, principles, laws, and theories) and physics as the process (scientific work). Therefore, a physics lesson is a lesson that teaches a wide range of knowledge that can develop the power of reason; the analysis so that almost all the problems connected with nature can be understood.

From my observation, there are still many students who find difficulty in studying physics because they cannot understand the physics of matter taught by teachers as a whole, resulting in low student

learning outcomes. In learning physics, the conventional learning model is still used, with an average value of less than satisfactory. Low student learning outcomes is due to the learning process that is only centered on the teacher (*teacher centered*) so that students just listen to the teacher's explanation.

Teachers also rarely provide the opportunity for students to interact with classmates or with teachers. Students mostly memorize the subject matter without relating the lessons to everyday life. The learning model used is less varied, resulting in the student being bored and less active when learning. Because they rarely do practicum or an experiment in understanding physics lessons, learning physics becomes less meaningful for students. Astra, Wahyuni and Nasbey (2015, p.75), and Akcay and Doymuş (2012, p.110) describe that the process of learning physics in a teacher-centered school causes teachers actively involved not to directly transfer the information to the students during the course of interaction.

Low student learning outcomes is because the process of learning to this day still gives dominance to the teacher and does not provide access for students to develop independently through the discovery and thinking processes (Sakinah & Purwanto, 2014, p.84; Irwan & Sani, 2015, p.42; & Wahyuningsih, Sarwi, & Sugianto, 2012, p.2).

The problems of students who find Physics difficult and are less active, and the lack of interaction and interpersonal communication skills to lessons need to be pursued. The solution is to perform actions that can change the atmosphere of learning that engages students. Students think that physics is boring and difficult to understand because there are too many formulas to be memorized and symbols that they do not understand, so that students are less interested in studying physics (Folina, Indrawati, & Astutik, 2012, p. 348; Musthofa, 2013, p. 56).

One effort to improve student learning outcomes through the implementation of working together to develop students' interpersonal communication, i.e., to implement a cooperative learning model. Cooperative learning model is an approach to learning that is appropriate to increase the activity and communication of students during the learning process that takes place. This learning comes from the concept that students can easily find and understand difficult concepts if it were in discussions with a friend. The main idea in cooperative learning is students working together to study and take responsibility for their learning progress. Akcay & Doymuş (2014 p.18) explains that the cooperative learning is a method of learning where students are assigned to small groups in the classroom as well as other environments and where they are helped to learn together. Students achieve more and increase individual confidence, develop communication skills and participate actively.

2. Methodology

The type of research was *quasi experiment by two group pretest – posttest* design. The study population was all students of class XI SMA Negeri 11 Medan in academic year 2016/2017. The sample in this study consists of two classes, namely the experimental class and control class, determined by *random sampling technique*. The study involved two classes that were given different treatment. One class was used as an experimental class and other class used as a control group. The results of student learning was found by giving a multiple choice test in second grade before and after treatment, which was analyzed using t-test (Sudjana, 2005).

3. Result and Discussion

In the implementation stage, teachers implemented cooperative learning model of GI appropriate lesson plant. Researchers divided the students into several groups, each group to guide experimentation and discussion. After that, each group presented their report. During the learning activity, the researchers conducted observations of the cognitive learning. The results of these observations were analyzed to see the effect of cooperative learning model GI during the learning process. The results showed that the effects of using cooperative learning model type GI on learning outcomes. It can be seen from the posttest results of the experimental class and control class.

TABLE 1: The average value of the experimental class and control

Class Data	Average Value	
	Pretest	Posttest
Experiment	43.46	77.89
Control	37.17	72.60

The above table shows that the average value resulting from the experimental class is higher than the average value generated from the control class, so it can be concluded that the learning outcomes of experimental class that learned using cooperative learning model type GI was better compared with the control class that learned with conventional models. This is consistent with research by Sakinah and Purwanto (2014) which stated that the learning outcomes in the experimental class was better than in the control class. Student learning outcomes were better in the experimental group than the control class because of some of the benefits of cooperative learning model GI compared to conventional learning, cooperative learning model GI focused more on students, who will be more active to construct direct knowledge through any activities that have been designed. In the control class which was teacher-centered learning, while students only heard, not too many students were involved in the work.

According to research conducted by Risnawati, Yulianti, Dwijananti (2012:13); Praptiwi & Handhika (2012:47); Mahardika, Subiki, & Mukharomah (2013:227), which states that the GI is a form of cooperative learning model that emphasizes the participation and activities of the students to find their own material (information) lessons will be learned through the materials provided. Students are involved from the planning, both in determining the topic as well as a way to learn through investigation.

The purpose of cooperative learning is to improve self-confidence and communication skills of individuals, strengthening the power of problem solving and critical thinking, and students actively participate in the educational process (Simsek, 2013: 5; Wahyuningsih, et al, 2012: 2).

A study conducted by Tsoi & Chia (2004) states that through the GI model, students interact with a lot of information while working collaboratively with others in a cooperative situation to investigate the problem, planning and presentation, and evaluate the results of their work. All members of the group in cooperative learning *GI* have tasks. This causes each member of the group to be active, there is interaction between students and students, and students with teachers. Students are trained to develop social communication skills, encouraging students to appreciate other people's opinions, and improve the academic skills of students, and students are trained to speak to the class. Therefore, GI cooperative learning model does not only affect the cognitive learning, but also on the development of interpersonal communication and psychomotor learning outcomes of students. According to Akcay & Doymuş (2012: 116). the main purpose of the implementation of cooperative technique is to give responsibility to the students and interaction with one another.

The existence of interactions between students causes interpersonal communication with each other. So during the investigation process, students are required to have good skills in communication. The development of students' interpersonal communication happens because students become more active, as the subject of learning in the classroom, actively studying the learning material, opinions, questions and answers, to promote knowledge, solve problems, discussions, and draw conclusions.

Through the activities of designing, researching, studying and doing practical work, students will gain work experience that is valuable and likely to apply *kefahaman* theories that have been learned through the tasks are accounted for (Chiu, Mahat, Hassan, Chik, & Yahya, 2010: 134).

The success of the GI cooperative learning model is based on many things i.e., this model stressed on the involvement of students in *full*. Investigation or inquiry conducted as learning activity, which gives students the possibility to develop understanding through various activities and learning outcomes in accordance with the development of the students. Learning activities traversed by solving problems or

issues assigned by the teacher, while the subsequent learning activities tend to be open, meaning not strictly structured by the teacher, which in practice refers to various theories of the investigation.

Although cooperative learning model of GI results in better learning and development of interpersonal communication which tends to increase as compared to conventional learning, there are some obstacles in conducting research: the relatively large amount makes the researcher unable to maximize managing time so there is a learning activity that is less effective, particularly in terms of control, drive and discipline students.

4. Conclusion

Based on an analysis of data from studies conducted, it can be concluded that student learning outcomes of students who were subjected to cooperative learning model type *group investigation* was better than the learning outcomes of students who were subjected to the conventional learning models. It can be seen from the average post-test students after being treated.

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6. References

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